

AMENDED CLAIMS – SUBMITTED EXCLUSIVELY TO
INCREASE THE CLARITY OF THE CLAIMS

037 What is claimed is:

1. A method for maintaining a desired flue parameter concentration as a byproduct or contaminant of combustion at the burners of a multiburner furnace with or without an independent oxidant flow rate within a predetermined range of sequential said flue parameter concentrations having an upper limit and a lower limit so as to deliver an appropriate oxidant flow rate through variably opening solenoid valves to a combustant at said burners of said multiburner furnace to increase efficiency and decrease pollution, said method being adapted for use with an electronic control unit (ECU) having memory, said multiburner furnace having a flue , a flue parameter concentration sensor, said oxidant delivery system controlled by said ECU for delivering a selected oxidant flow rate to said combustants at said burners of said multiburner furnace to maintain said flue parameter concentration in a stable base state within a predetermined range of said sequential values having said upper

limit and said lower limit to increase efficiency and decrease pollution, a circulation time referred to as a circulation time delay and current circulation time between said combustion and said flue parameter concentration sensing, a reaction time denoting terminal local maximum or minimum or extreme oxidant delivery at dose selection, said method having a plurality of said oxidant flow rate levels and consequential said flue parameter concentrations ranging from said smallest oxidant flow rate level and said flue parameter concentration to said largest oxidant flow rate level and said flue parameter concentration, the method also comprising:

delivering said largest oxidant flow rate to said burners and thereby said largest flue parameter concentration as said byproduct or contaminant to said flue, while repeatedly sequencing through said plurality of sequential said flue parameter concentrations beginning with said smallest flue parameter concentration and proceeding to said adjacent flue parameter concentration in said sequence after a predetermined time interval has elapsed until said flue parameter concentration of said method attains said desired flue parameter range at which point said oxidant flow rate is

selected from said plurality of said sequential oxidant flow rates.

delivering said selected oxidant flow rate to said multiburners so as to maintain said flue parameter concentration in said flue in said desired range.

2. The method of claim 1 wherein CO concentration is said flue parameter.

3. The method of Claim 1 wherein said circulation time is determined by:

means for storing a predetermined number of said base state values in memory; and

means for determining a predetermined sequence of said base state values.

4. The method of claim 1 wherein said reaction time is determined by logic flow charts.

5. The method of Claim 1 wherein temperature is said flue parameter.

6. The method of Claim 1 wherein NO concentration is said flue parameter.

7. The method of Claim 1 wherein compressed gaseous air is said oxidant.

8. The method of Claim 1 wherein compressed oxygen gas is said oxidant.

9. The method of Claim 1 wherein said combustant is solid, liquid, or gas.

10. The method of Claim 1 wherein said combustant is a hydrocarbon.

11. A method for maintaining a desired flue parameter level in a multiburner furnace within a predetermined range of sequential values having an upper limit and a lower limit so as to deliver an appropriate oxidant flow rate to a combustant with or without an

independent said oxidant flow rate at said burners of said multiburner furnace to increase efficiency and decrease pollution, said method being adapted for use with said device including an electronic control unit (ECU) having memory, said multiburner furnace, a flue, a flue parameter concentration sensor, an oxidant delivery system controlled by said ECU through variably opening solenoid valves for delivering a selected oxidant flow rate to said combustant at said burners to maintain said flue parameter concentration within a predetermined range of sequential values having an upper limit and a lower limit in a stable base state, a circulation time referred to as a current circulation time or a circulation time delay between said combustion and said flue parameter sensing, a reaction time denoting said time to select said oxidant flow rates, said method having a plurality of said oxidant flow rates and said flue parameter concentrations ranging from said smallest oxidant flow rate and said flue parameter concentration to said largest oxidant flow rate and said flue parameter concentration, the method further comprising:

delivering said largest oxidant flow rate to said burners and
thereby said consequential largest flue parameter concentration

as a byproduct or contaminant to said flue, while repeatedly sequencing through the plurality of said oxidant flow rates beginning with said smallest oxidant flow rate and proceeding to said adjacent oxidant flow rate in said sequence after a predetermined time interval has elapsed until said flue parameter concentration level of said multiburner furnace attains said desired flue parameter range at which point a corresponding said oxidant flow rate is selected from said plurality of sequential oxidant flow rates.

delivering said selected oxidant flow rate to said multiburners and said consequential flue parameter concentration to said flue so as to maintain said flue parameter level in said desired range.

12. The method of claim 11 wherein CO concentration is said flue parameter.

13. The method of Claim 11 wherein said circulation time is determined by:

means for storing a predetermined number of said base state

values in said memory; and

means for determining a predetermined sequence of said base state values.

14. The method of claim 11 wherein said reaction time is determined by logic flow charts.

15. The method of Claim 11 wherein temperature is said flue parameter.

16. The method of Claim 11 wherein NO is said flue parameter.

17. The method of Claim 11 wherein compressed gaseous air is said oxidant.

18. The method of Claim 11 wherein compressed oxygen gas is said oxidant.

19. The method of Claim 1 wherein said combustant is solid, liquid, or gas.

20. The method of Claim 1 wherein said combustant is a hydrocarbon.